

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Masahito OSAWA et al.

Group Art Unit : 1793

Appl. No. : 10/598,082 (U.S. National  
Stage Of PCT/JP2005/003229)

Examiner : Fogarty

I.A. Filed : February 21, 2005

Confirmation No. : 9910

For : METHOD FOR PRODUCING Mg-REM-Ni BASED  
HYDROGEN-ABSORBING ALLOY

## APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Commissioner for Patents  
U.S. Patent and Trademark Office  
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Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

Sir :

This appeal is under 35 U.S.C. 134 from the decision of the Examiner finally rejecting claims 1, 4, 9, 12, 16 and 19 as forth in the Final Office Action dated July 8, 2010 as modified by the Advisory Action dated October 19, 2010.

A Notice of Appeal to the July 8, 2010 Final Office Action has been filed on November 5, 2010 so that the time for filing an Appeal Brief extends until January 5, 2011.

Appellant notes that this Appeal Brief is being filed by January 5, 2011 so that an extension of time and the fee associated therewith should not be necessary for maintaining the pendency of the application. However, if for any reason any extension of time and/or any fee is necessary to maintain the pendency of the application, including any extension of time and/or any appeal fee, this is an

express request for any required extension of time and authorization to charge any necessary fee to Deposit Account No. 19-0089.

The requisite fee under 37 C.F.R. 41.20(b)(2) in the amount of \$540.00 for the filing of the Appeal Brief is being paid herewith.

As noted above, if for any reason any extension of time and/or any fee is required to maintain the pendency of the application, including any extension of time and/or appeal fee, authorization is hereby provided to charge any required fee, including any fee for the Appeal Brief and any necessary extension of time fee to Deposit Account No. 19-0089.

**(I) REAL PARTY IN INTEREST**

The real party in interest is Japan Metals and Chemicals Co., Ltd. by an assignment from the inventors recorded November 27, 2006, at Reel 018633, Frame 0758 (5 pages).

**(II) RELATED APPEALS AND INTERFERENCES**

None

There are no pending related appeals and/or interferences.

**(III) STATUS OF CLAIMS**

The status of the claims is as follows:

Claims 1, 4, 9, 12, 16 and 19 are pending in this application and are under appeal.

Claims 2, 3, 5-8, 10, 11, 13-15, 17, 18 and 20 are canceled.

Of the pending claims, claims 1, 4, 9, 12, 16 and 19 have been finally rejected in the Final Office Action dated July 8, 2010 as modified by the Advisory Action dated October 19, 2010.

The finally rejected claims included in the listing of Claims Under Appeal.

**(IV) STATUS OF AMENDMENTS**

The appeal is based upon finally rejected claims.

An amendment was filed October 8, 2010 wherein claims 1, 9 and 12 were amended, and claims 2, 3, 5-8, 10, 11, 13-15, 17, 18 and 20 were canceled.

An Advisory Action dated October 19, 2010 entered Appellant's amendment filed October 8, 2010 so that the finally rejected claims are claims 1, 4, 9, 12, 16 and 19 as amended in the response filed October 8, 2010. The Advisory Action indicated that claims 1, 4, 9, 12, 16 and 19 are rejected.

**(V) SUMMARY OF THE CLAIMED SUBJECT MATTER**

The following description is made with respect to the independent claim and includes references to particular parts of the specification. As such, the following is merely exemplary and is not a surrender of other aspects of the present invention that are also enabled by the present specification and that are directed to equivalent methods within the scope of the claims.

**Independent Claim 1**

Independent claim 1 recites a method of producing a Mg-REM-Ni based hydrogen-absorbing alloy (e.g., page 3, line 34 to page 4, line 2), comprising a first step of melting a rare earth element starting material having a low evaporation pressure and a nickel starting material in a melting furnace to obtain a melt of REM-Ni alloy (e.g., page 4, lines 3-12); a second step of adding magnesium starting material to the melt of REM-Ni alloy wherein the temperature of the melt of REM-Ni alloy at the addition of the magnesium starting material is 1250-1400°C (e.g., page 4, lines 13-16; page 4, lines 18-21; and page 6, line 30 to page 7, line 3), the magnesium starting material comprising elemental Mg or Mg<sub>2</sub>Ni (Examples 1 and 2, at page 8, line 13 and page 9, line 16), and keeping a pressure inside the melting furnace after the addition of the magnesium starting material at a pressure of 350-500 Torr (e.g., page 7, lines 16-25) to obtain a melt of Mg-REM-Ni alloy (e.g., page 4, lines 13-16); and a third step of cooling and solidifying the melt of Mg-REM-Ni alloy at a given cooling rate (e.g., page 4, lines 17-18).

**(VI) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

(a) Claims 9 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(b) Claims 1, 4, 9, 12, 16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-226722 (machine English translation and abstract being of record and forwarded with Office Action dated February 5, 2009).



**(VII) ARGUMENT**

**(I) Traversal of rejection of claims 9 and 12 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

**(a) Claims 9 and 12 are not properly rejected under 35 U.S.C. 112, second paragraph, as being indefinite.**

***(A) Arguments for dependent claims 9 and 12***

Claims 9 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite because the examiner contends that the Mg in these claims should be amended to “elemental Mg”.

In response, Appellant notes that the currently pending claims 9 and 12 explicitly recite “elemental Mg” having been amended in Appellant’s amendment filed October 8, 2010 entered by the Advisory Action dated October 19, 2010.

Accordingly, this ground of rejection should be withdrawn.

**(II) Traversal of rejection of claims 1, 4, 9, 12, 16 and 19 under 35 U.S.C. 103(a) as being unpatentable over JP 2001-226722 (machine English translation being of record).**

**(a) Claims 1,4, 9, 12, 16 and 19 are not properly rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-226722 (hereinafter “JP ‘722” and references to portions of JP ‘722 being made with respect to the machine English translation).**

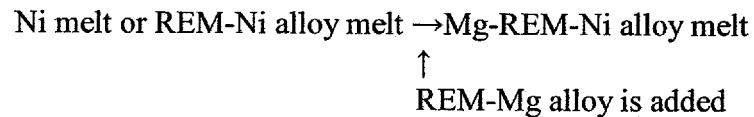
***(A) Arguments for Independent Claim 1 and Dependent Claim 4***

**The rejection of independent claim 1 and dependent claim 4 under 35 U.S.C. 103(a) as being unpatentable over JP '722 is in error, the decision of the Examiner to reject these claims should be reversed, and the application should be remanded to the Examiner.**

Appellant's independent claim 1 is directed to a method of producing a Mg-REM-Ni based hydrogen-absorbing alloy, comprising a first step of melting a rare earth element starting material having a low evaporation pressure and a nickel starting material in a melting furnace to obtain a melt of REM-Ni alloy; a second step of adding magnesium starting material to the melt of REM-Ni alloy wherein the temperature of the melt of REM-Ni alloy at the addition of the magnesium starting material is 1250-1400°C, the magnesium starting material comprising elemental Mg or Mg<sub>2</sub>Ni, and keeping a pressure inside the melting furnace after the addition of the magnesium starting material at a pressure of 350-500 Torr to obtain a melt of Mg-REM-Ni alloy; and a third step of cooling and solidifying the melt of Mg-REM-Ni alloy at a given cooling rate.

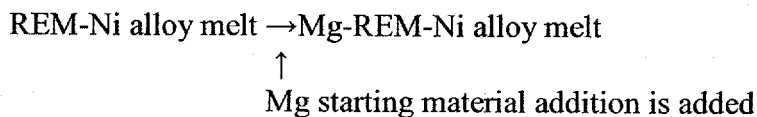
Appellant submits that there is no reason to arrive at Appellant's claimed subject matter based upon JP '722, especially in view of the negative teachings of JP '722. JP '722 discloses a method of melting in paragraph [0016] wherein a rare earth-Mg system alloy is prepared first, which is supplied to nickel molten metal or a rare earth-nickel alloy molten metal, and the hydrogen storing metal alloy of a requested presentation is prepared. Moreover, claim 1 of JP '722 includes that a rare earth-magnesium-nickel alloy of the requested presentation is prepared by adding a rare earth-magnesium alloy to the nickel melt or rare earth-nickel alloy.

The method disclosed by JP '722 is simply illustrated as follows.



To the contrary, the melting method of the present invention, as recited in Appellant's independent claim 1, is directed to a method of obtaining a Mg-REM-Ni alloy melt by melting a rare earth element starting material and a nickel starting material in a melting furnace to obtain a melt of REM-Ni alloy at a first step, then adding a magnesium starting material comprising Mg or Mg<sub>2</sub>Ni to the melt of REM-Ni alloy at a second step, and at the same time keeping pressure inside the melting furnace at a given level of 350-500 Torr.

This is simply illustrated as follows.



In other words, the melting method of JP '722 is a technique of manufacturing a REM-Mg system alloy having a low melting point (600-1000°C) in advance, using it as an additional starting material to lower the temperature of a REM-Ni series alloy melt and control composition change caused by evaporation of Mg, and thus obtaining a Mg-REM-Ni alloy of the requested composition.

**JP '722 is directed to a technique of controlling evaporation of Mg by using Mg-REM of lower melting temperature as a starting material, while Appellant's claimed subject matter is directed to a technique of preventing the evaporation of Mg by adjusting pressure to be in an appropriate range inside a furnace when melting alloy and by controlling melting temperature.** Thus, Appellant's independent claim 1 includes a first step of melting a rare earth element starting material having a low evaporation pressure and a nickel starting material in a

melting furnace to obtain a melt of REM-Ni alloy; a second step of adding magnesium starting material to the melt of REM-Ni alloy wherein the temperature of the melt of REM-Ni alloy at the addition of the magnesium starting material is 1250-1400°C, the magnesium starting material comprising elemental Mg or Mg<sub>2</sub>Ni, and keeping a pressure inside the melting furnace after the addition of the magnesium starting material at a pressure of 350-500 Torr to obtain a melt of Mg-REM-Ni alloy; and a third step of cooling and solidifying the melt of Mg-REM-Ni alloy at a given cooling rate. Certainly, **this combination of process steps is not suggested by JP '722 which is directed to a fundamentally different process including its manner of preventing evaporation of Mg.**

The present invention discloses the technique of melting REM starting material and Ni starting material to obtain REM-Ni alloy melt, adding Mg starting material comprising Mg or Mg<sub>2</sub>Ni, further setting the alloy melting temperature at the time of Mg starting material being added as the appropriate range, controlling the pressure in the melting furnace after Mg starting material is added so that the alloy melting temperature could be controlled in the appropriate range and that the evaporation of Mg could be inhibited, and thus obtaining the desired Mg-REM-Ni alloy.

With respect to the above, attention is directed to, for example, Appellant's specification at page 7, first two full paragraphs, wherein the importance of temperature and pressure in Appellant's claimed process is disclosed:

In this case, the temperature of the melt is required to be kept within the above temperature range even after the addition of the magnesium starting material. However, the inside of the furnace after the addition of Mg is filled with the Mg vapor, so that it is very difficult to visually confirm the temperature of the melt by inserting a thermocouple or the like into the melt. In the invention, therefore, the pressure inside the melting furnace is controlled instead that the temperature inside the melting furnace is kept within the above temperature range to provide substantially the same melting condition as in the temperature range.

Moreover, FIG. 1 is a graph showing a relation between the pressure inside the melting furnace and the temperature of the melt. That is, when the pressure inside the furnace is controlled by an output load of the melting furnace for controlling the temperature of the melt to the above range, the temperature of the melting atmosphere can be naturally controlled to the above range, which renders the control of accurate magnesium composition. In this case, the pressure inside the furnace corresponding to the temperature range is 350-500 Torr as seen from FIG. 1.

Japan '722 does not disclose a second step of adding magnesium starting material comprising Mg or  $Mg_2Ni$  to the melt of REM-Ni alloy and keeping a pressure inside the melting furnace at a given level to obtain a melt of Mg-REM-Ni alloy.

Furthermore, the present invention discloses the method of obtaining the desired compound alloy of high precision by melting Mg having high vapor pressure and a metal having a higher melting point than Mg. In contrast, JP '722 includes the premise that the corresponding alloy, i.e., REM-Mg alloy, already exists and does not provide disclosure how to obtain this alloy.

The Examiner attempts to arrive at Appellant's claimed subject matter by contending that JP '722 discloses (referencing paragraphs [0006] and [0007] of JP '722) that it is known in the art to use Mg metal as the magnesium starting material. However, JP '722 teaches that it is not preferable to add Mg metal directly to an elevated temperature molten metal because a large amount of Mg will evaporate. The rejection contends that it would have been obvious to one of ordinary skill in the art to use the known magnesium starting material of Mg in the method of JP '722 with the expectation of a large amount of Mg or  $Mg_2Ni$  evaporation.

However, the disclosure of JP '722 teaches away from arriving at Appellant's claimed method and, in fact, specifically discloses problems with adding Mg metal directly to an elevated temperature molten metal and provides a method for avoiding adding a rare earth-magnesium system

hardener to a nickel molten metal or a rare earth-nickel series molten metal, and does not disclose or suggest the method steps recited Appellant's independent claim 1.

Emphasizing the above, Applicants note that JP '722 discloses in paragraphs [0006] and [0007] that "Mg metal cannot be directly added to a high temperature melt when producing a hydrogen absorbing alloy mainly composed by Mg, Ni and rare earth element" and that "there is a problem in the conventional method of producing a hydrogen absorbing alloy mainly composed by Mg, Ni and rare earth element, which requires to set the melting temperature high because of using Mg-Ni alloy of a high melting point as an alloy material, causes not only a poorer productivity in the mass production but also a huge composition variation in the alloy by Mg's vaporization and makes the alloy composition control more difficult compared to the case of using LaNi<sub>5</sub> alloy". Due to the above, JP '722 further describes that Mg metal and Mg-Ni alloy cannot be used as a material of the hydrogen absorbing alloy mainly composed by Mg, Ni and the rare earth element.

As discussed in MPEP 8<sup>th</sup> Edition, 2141.02 Differences Between Prior Art and Claimed Invention [R-5], "Ascertaining the differences between the prior art and the claims at issue requires interpreting the claim language, and considering both the invention and the prior art references as a whole." In the instant situation, Appellant's claimed subject matter is contrary to the understandings and expectations of JP '722, and the claimed method would not have been obvious to one having ordinary skill in the art.

Appellant does note that JP' 722 has a same purpose of Appellant's application in terms of trying to prevent the alloy composition variation. However, in JP'722, "rare earth-Mg alloy of a low melting point" is prepared instead of Mg metal and Mg-Ni alloy in order to solve the above

problem and the alloy is added to "the melt of Ni" or "the melt of rare earth-Ni alloy" to produce the hydrogen absorbing alloy of the desired composition (see J P '722 Paragraph [0016]). In other words, JP'722 clearly eliminated the option of using elemental Mg or  $Mg_2Ni$  as a material due to the above problem, and one having ordinary skill in the art would not seek to use either of elemental Mg or  $Mg_2Ni$  in a process as recited by Appellant.

In contrast, independent claim 1 is directed to a method of using elemental Mg or  $Mg_2Ni$  as Mg starting material which JP'722 eliminated and is completely different from that of JP'722. That is, Appellant found that Mg's vaporization from the melt of Mg-REM-Ni alloy can be prevented by setting the melting temperature of 1250 - 1400 °C. However, when Mg starting material is added to the melt of REM-Ni alloy of the temperature being set at 1250 - 1400°C, the accurate temperature cannot be measured due to the melting temperature deviation caused by the generated Mg vapor. Therefore, Appellant focused on the correlation between the inner furnace's pressure and the melting temperature and proposed the technique of obtaining REM-Ni-Mg alloy of the desired composition by controlling the inner furnace's pressure in order to indirectly and accurately control the melting temperature after adding Mg starting material to the melt and preventing the composition variation caused by Mg's vaporization.

Paragraphs [0038] to [0045] of JP '722 describe that the temperature of the melt of Ni-REM alloy is lowered before Mg starting material (REM-Mg alloy) is added, however, there is no mentioning of temperature control after Mg starting material is added. Furthermore, there is no suggestion of controlling the inner furnace's pressure. Therefore, JP '722 cannot prevent the vaporization of Mg after Mg starting material is added. This is evident from the comparative examples 1 and 2 of JP '722 which show that Mg is decreased by 13.5% or more when the same

Mg-Ni alloy is used as Mg starting material, which is the starting material used in Appellant's independent claim 1.

Due to the above, the method of JP '722 is a completely different from that as claimed by Appellant and it would not have been possible for one having ordinary skill in the art to arrive at the claimed subject matter based on JP '722 which does not have the technological thought of, preventing the dissipation of the vaporized Mg by controlling the furnace's power in terms of the inner furnace's pressure as an index and controlling the alloy melting temperature as 1250-1400°C.

Thus, Appellant's claimed subject matter permits the use of Mg metal and Mg<sub>2</sub>Ni which are economical and easily obtained. This is in contrast to JP' 722 where it is necessary to especially prepare REM-Mg alloy.

As noted in MPEP, Rev. 6, Sept. 2007, at 2100-130 (with bolded emphasis added):

Note that combining known prior art elements is not sufficient to render the claimed invention obvious if the results would not have been predictable to one of ordinary skill in the art. *United States v. Adams*, 383 U.S. 39, 51-52, 148 USPQ 479, 483-84 (1966). In *Adams*, the claimed invention was to a battery with one magnesium electrode and one cuprous chloride electrode that could be stored dry and activated by the addition of plain water or salt water. Although magnesium and cuprous chloride were individually known battery components, the Court concluded that the claimed battery was nonobvious. **The Court stated that “[d]espite the fact that each of the elements of the Adams battery was well known in the prior art, to combine them as did Adams required that a person reasonably skilled in the prior art must ignore” the teaching away of the prior art that such batteries were impractical and that water-activated batteries were successful only when combined with electrolytes detrimental to the use of magnesium electrodes. *Id.* at 42-43, 50-52, 148 USPQ at 480, 483. “When the prior art teaches away from combining certain known elements, discovery of successful means of combining them is more likely to be nonobvious.” *KSR*, 550 U.S. at \_\_\_, 82 USPQ2d at 1395.**



Paragraph [0009] of JP '722 specifically discloses "Means for Solving the Problem", with "a manufacturing method of a hydrogen storing metal alloy of this invention Magnesium, In manufacturing a hydrogen storing metal alloy which uses nickel and a rare earth element as main composing elements, by adding a rare earth-magnesium system hardener to a nickel molten metal or a rare earth-nickel series molten metal, It is characterized by preparing a rare earth-magnesium nickel series alloy of a request presentation."

In fact, paragraph [0010] of JP '722 specifically states (with bolded emphasis added),

[0010]In a manufacturing method of a hydrogen storing metal alloy of this invention, as a hardener containing magnesium, Compared with the conventional magnesium nickel series hardener, **a rare earth-magnesium system hardener of a low melting point is used**, and a rare earth-magnesium nickel series alloy of a request presentation is prepared by adding this to a nickel molten metal or a rare earth-nickel series molten metal. Therefore, **since molten metal temperature at the time of dissolving a hardener containing magnesium can be lowered, a composition change by evaporation of magnesium can be controlled and it becomes possible to be stabilized and to control alloy composition easily**. Productivity in a volume production level can be improved.

Thus, JP '722 teaches away from Applicants' claimed subject matter, and one having ordinary skill in the art would not have arrived at Applicants' claimed subject matter.

Regarding the pressure in the melting furnace, the rejection admits that JP '722 does not disclose this feature, but contends that it would have been obvious to one having ordinary skill in the art based upon the method of JP '722 since the furnace is maintained in a vacuum state. However, Appellant submits that JP '722 does not describe the pressure inside the furnace at the time of melting, but describes in examples melting of the rare earth-Mg system alloy that molten raw material is thrown in a crucible, and after carrying out full evacuation of the inside of a melting furnace, argon gas is introduced to 0.1 MPa (750 Torr) in the furnace for dissolution, see [0040] and [0046]. That is, JP '722 does not carry out melting under vacuum but under pressure of 0.1 MPa

(750 Torr). In this connection, when Mg is melted under pressure of 0.1MPa (750 Torr), as understood from Fig. 1 of the specification of the present application, a molten bath temperature becomes not less than 1500°C and cannot prevent transpiration of Mg.

In the Advisory Action, the Examiner contends that it would have been obvious to one of ordinary skill in the art to optimize the pressure inside the melting furnace after the addition of the magnesium starting material through routine experimentation in order to control the evaporation of Mg to a desired level. This contention is not supported by any disclosure of JP '722 which specifically discloses a problem associated with the large evaporation of Mg, such as in paragraph [0007] of JP '722. To overcome this large evaporation, JP '722 discloses his improved process and one having ordinary skill in the art would experiment with the method disclosed by of JP '722, and would not have arrived at Appellant's method recited in Appellant's independent claim 1 which is taught away from by JP '722.

The Advisory Action also contends that Appellant has not demonstrated that the instant invention would produce unexpected results from what is already known in the art which is a large amount of Mg evaporation when either elemental Mg or  $Mg_2Ni$  is used as a magnesium starting material. In contrast, Appellant's disclosure is directed to such a showing including the paragraph beginning at the bottom of page 4; the paragraph beginning at the bottom of page 6 and continuing through the first two paragraphs on page 7; and Examples 1 and 2 as compared to Comparative Examples 1 and 2. In particular, the first full paragraph on page 11 of Appellant's specification discloses:

As seen from Tables 1 and 2, according to the method of the invention, it is possible to produce the alloys having a target composition while controlling the scattering. On the contrary, the loss of Mg due to evaporation can not be controlled in the method of

the comparative example, and the composition is largely scattered from the target one, and the scattering of the alloy composition is caused.

Thus, in contrast to the Examiner's contentions the advantages associated with Appellants' claimed subject matter is disclosed in Appellant's originally filed application.

The Advisory Action further contends that Appellant has not demonstrated the criticality of the claimed temperature range or the pressure inside the melting furnace. However, Appellant once again directs attention to Appellant's originally filed specification, including the noted portions and the Examples, which denote the importance of the recited temperature and pressure conditions.

The rejection of record does not address any of the above-noted disclosure by Appellant's and merely improperly tries to support the rejection based upon naked assertions of obvious without properly establishing how the prior art can be modified or why it should be modified in a manner to arrive at Appellant's claimed subject matter.

Moreover, the rejection uses inherency language. However, the rejection does not support any inherency assertion with appropriate technical reasoning. Inherency requires that there must be a necessary result and not merely a possible result.

The features of Appellant's independent claim 1 relating to pressure and temperature are not taught or suggested by JP '722, and further advantages associated with Appellant's recited process, as see, for example, Appellant's specification beginning at the bottom of page 6. One having ordinary skill in the art would not have sought to arrive at these claimed features in JP '722 based upon the different method conditions associated with the method specifically disclosed by JP '722 including the explicitly disclosed use of **a rare earth-magnesium system hardener of a low melting point.**

Still further, Appellant's dependent claim 4 further defines independent claim 1 by reciting wherein the cooling rate in the cooling and solidifying the melt of Mg-REM-Ni alloy is 50-500°C/sec at the third step, and is patentable over JP '722 at least for the reasons set forth with respect to independent claim 1.

Appellant submits that the obviousness rejection of Appellant's claims 1 and 4 uses improper hindsight based upon Appellant's disclosure in an attempt to arrive at Appellant's claimed subject matter. However, one having ordinary skill in the art would not have arrived at Appellant's claimed subject matter at least for the reasons set forth above.

Therefore, the rejection of record should be withdrawn.

***(B) Arguments for Dependent Claims 9 and 12***

**The rejection of dependent claims 9 and 12 under 35 U.S.C. 103(a) as being unpatentable over JP '722 is in error, the decision of the Examiner to reject this claim should be reversed, and the application should be remanded to the Examiner.**

Appellant's dependent claims 9 and 12 further patentably define independent claim 1 and dependent claim 4, respectively, by reciting wherein the magnesium starting material is elemental Mg. Therefore, claims 9 and 12 are patentable for at least the reasons set forth with respect to claims 1 and 4, and for the additional reasons set forth herein.

JP '722 specifically teaches away from using elemental Mg in the manufacture of hydrogen storing material let alone elemental Mg as included in the method recited in Appellant's dependent claims 9 and 12, so that one having ordinary skill in the art would not have arrived at Appellant's claimed subject matter. JP '722 refers to elemental Mg and

specifically teaches against the use of elemental Mg in other processes let alone Appellant's recited methods.

Accordingly, the rejection of record is without appropriate basis and should be withdrawn.

***(C) Arguments for Dependent Claims 16 and 19***

**The rejection of dependent claims 16 and 19 under 35 U.S.C. 103(a) as being unpatentable over JP '722 is in error, the decision of the Examiner to reject this claim should be reversed, and the application should be remanded to the Examiner.**

Appellant's dependent claims 16 and 19 further patentably define independent claim 1 and dependent claim 4, respectively, by reciting wherein the magnesium starting material is elemental  $Mg_2Ni$ . Therefore, claims 16 and 19 are patentable for at least the reasons set forth with respect to claims 1 and 4, and for the additional reasons set forth herein.

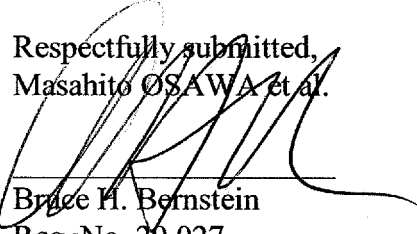
JP '722 specifically teaches away from using elemental Mg in the manufacture of hydrogen storing material, and does not disclose the use of  $Mg_2Ni$  let alone  $Mg_2Ni$  as included in the method recited in Appellant's dependent claims 16 and 19, so that one having ordinary skill in the art would not have arrived at Appellant's claimed subject matter. JP '722 does not teach or suggest the use of  $Mg_2Ni$  let alone  $Mg_2Ni$  in Appellant's recited methods.

Accordingly, the rejection of record is without appropriate basis and should be withdrawn.

**CONCLUSION**

For the reasons set forth above, it is respectfully submitted that the Examiner has failed to establish that a *prima facie* case of obviousness is present, which is a prerequisite for maintaining a rejection under 35 U.S.C. 103(a). The Board is, therefore, respectfully requested to reverse the Final Rejection, and to allow the application to issue in its present form.

Respectfully submitted,  
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Attachments: (VIII) Claims Appendix  
(IX) Evidence Appendix  
(X) Related Proceedings Appendix

**(VIII) CLAIMS APPENDIX****CLAIMS ON APPEAL**

1. A method of producing a Mg-REM-Ni based hydrogen-absorbing alloy, comprising a first step of melting a rare earth element starting material having a low evaporation pressure and a nickel starting material in a melting furnace to obtain a melt of REM-Ni alloy; a second step of adding magnesium starting material to the melt of REM-Ni alloy wherein the temperature of the melt of REM-Ni alloy at the addition of the magnesium starting material is 1250-1400°C, the magnesium starting material comprising elemental Mg or Mg<sub>2</sub>Ni, and keeping a pressure inside the melting furnace after the addition of the magnesium starting material at a pressure of 350-500 Torr to obtain a melt of Mg-REM-Ni alloy; and a third step of cooling and solidifying the melt of Mg-REM-Ni alloy at a given cooling rate.

4. A method according to claim 1, wherein the cooling rate in the cooling and solidifying the melt of Mg-REM-Ni alloy is 50-500°C/sec at the third step.

9. A method according to claim 1, wherein the magnesium starting material is elemental Mg.

12. A method according to claim 4, wherein the magnesium starting material is elemental Mg.

16. A method according to claim 1, wherein the magnesium starting material is Mg<sub>2</sub>Ni.

19. A method according to claim 4, wherein the magnesium starting material is Mg<sub>2</sub>Ni.

**(IX) Evidence Appendix**

Copies of evidence entered by the Examiner and relied upon by Appellant in the appeal along with statements setting forth where in the record that evidence was entered in the record by the Examiner.

JP 2001-226722 (including machine English translation and abstract) - entered in the record in initialed Information Disclosure Statement form attached to Office Action mailed February 5, 2009 with the machine English translation and abstract being forwarded with the February 5, 2009 Office Action.



**(X) Related Proceedings Appendix**

None